



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number : 10/021,656
Applicant : Gary C. Johnson
Application Filed : 12-12-2001
Art Unit : 3681
Examiner : Dirk Wright
Supervisor : Charles (Chuck) Marmor
Application Status : Ex Party Quayle, as of; 11/06/06

CLAIMS

Claims 1-16 (cancelled)

Claim 17 (amended) A new differential for a vehicle that is a combination of two planetary gears that, can rotate both axle sections of the said vehicle; under all road conditions and yet allows axle section variability when needed, said differential comprising:

at least one said first bevel gear planetary gear including:

a drivable case (8) having a means of rotatable support in a housing, bevel pinion gears (13,14) rotatively mounted in said case (8) on pinion gear shafts (3,4), side bevel gears (11,12) mounted for rotation in said case (8) and meshing with said pinion gears (13,14), a first axle shaft (5) stationary to one side bevel gear (12), and a second axle shaft (10) stationary to the other side bevel gear whether directly or indirectly, said differential further comprising:

at least one said second planetary gear including:

said drivable case (8) in a housing, two sun gears (6,7) at least one planet gear (15,16), a planetary gear carrier (9), a hollow intermediate shaft (19), a said first axle shaft (5), and a said second axle shaft (10);

wherein:

(a) said planetary gear carrier (9) being independently rotational of any other housing of said differential and supporting said at least one planet gear (15,16) and said planetary gear carrier (9) being axially stationary to said other side gear (11), axially and rotationally supported in differential housing (8), and axially stationary to said second axle (10),

Claim -17; continued, and Claim - 18

(b) a hollow intermediate shaft (19) stationary to said case (8) by support member (1), and support stock (2), said intermediate shaft (19) being coaxial with the said first axle shaft and said pinion gears shafts (3,4), said intermediate shaft being disposed coaxially with the said first axle shaft (5), and

(c) said a first sun gear (7) being open throughout it's central axial stock and axially stationary to the end of said intermediate shaft (19), and

(d) said a second sun gear (6) axially stationary to a protruding end of said first axle shaft (5), and

(e) at least one gear shaft (17,18) mounted in the said planetary gear carrier, being off of center, stationary, and parallel to the axis of said planetary gear carrier, and

(f) said at least one planet gear (15,16) having rotational and radial support in said planetary gear carrier (9) by way of said at least one gear shaft (17,18) and said at least one planet gear (15,16) meshing with said first and second sun gears (6,7).

Claim 18 (amended) The combination planetary gear differential according to claim 17 having said at least one second planetary gear comprising:

said case (8) drivable for rotation in a housing, said two sun gears (6,7), said at least one planet gear (15,16), said a planetary gear carrier (9), said hollow intermediate shaft (19), said support stock (2) and said support member (1); for intermediate shaft (19);

wherein:

(a) said a case (8) rotatable in a stationary housing having axial openings,

(b) said planetary gear carrier (9) axially rotatable and in said case (8), and

(c) said a hollow intermediate shaft (19) axially stationary to said case (8) by said support member (1) and said support stock (2), said intermediate shaft entered into said planetary gear carrier (9), and

Claim – 18; continued

- (d) said a first sun gear (7) axially stationary to the end of said intermediate shaft (19), and
 - (e) said a first axle shaft (5) rotatably and coaxially entered through said intermediate shaft (19) and said first axle shaft (5), protruding past said intermediate shaft (19), and
 - (f) said second sun gear (6) stationary to the protruding end of axle shaft (5), and
 - (g) said at least one gear shaft (17,18) mounted in the said planetary gear carrier (9) off of center and parallel to the central axis of the said rotatable case (8), and
 - (h) said at least one planet gear (15,16) rotatable on said at least one off of center gear shaft (17,18), said at least one planet gear (15,16) meshing with said first and second sun gears (6,7).
-